ABSTRACT

Title: Electromyographic analysis of mutual relation between standing and movement pattern in shoulder girdle

Objectives: This thesis examines the electric activity and recruitment (timing) of m. latissimus dorsi, m. obliquus externus abdominis, m. gluteus maximus, m. tensor fasciae latae, m. tibialis anterior, m. erector spinae and m. trapezius during shoulder girdle movement standing on both feet, ipsilateral or contralateral foot. Furthermore the thesis explores whether it is possible to objectify the existence of published tendomuscular chains or the whole hypothetic Latissimus dorsi muscle chain of Spiral stabilization concept using surface electromyography.

Methods: The muscles mentioned above were measured bilaterally with surface electromyography electrodes during particular movements. Twelve healthy individuals participated, seven women and five men in the age of 23 – 30. All participants were instructed to do the specific movement from Spiral Stabilization concept against the 2kg resistence of elastic rope when standing on both feet or in one leg stand on contralateral or ipsilateral leg.

Results: We can identify muscles that are active in the particular movements almost within all participants, that are activated less often and those that are involved rarely. But we are not able to confirm their precise order according to predicted one. Our results are also showing high level variability of normalized average amplitude (% MVC) measured values within all participants in all three movements. Our results are not proving neither disproving the existence of hypothetic latissimus dorsi muscle chain. When examining diferencies between muscle activation patterns of hypothetic muscle chain in three versions of movement oposite pattern of trunk muscles involvement to peripheral muscles – leg muscles was found between exercise on both feet and both exercises performed on one foot only.

Keywords: muscle chains, Spiral stabilization, surface electromyography, MVC, timing